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Iowa State College, Ames, Iowa

1958 Outlook Issue

ISC's 100th YEAR . . .

This year Iowa State College will celebrate her first century of service to the people of the state. It was on March 22, 1858, that Gov. Ralph P. Lowe signed the act to ". . . provide for the establishment of a State Agricultural College and Farm."

Since that date, the College has continued to grow in size and scope. The first freshman class had 173 students; today Iowa State enrolls about 10,000. At first there were but two curricula; today there are students enrolled in 56 different curricula.

This centennial year is a good opportunity not only to review accomplishments of the past but also to look ahead to increased responsibilities for the future.

Throughout 1958 there will be several major events of interest held at the College to bring "honor to the past and vision for the future." You may be interested in attending some of these events.

— March 22 — Founders' Day

— March 23-25 — Centennial Symposia

— May 15-17 — Veishea Festival

— June 13-15 — Commencement week-end activities.

January Iowa Farm Science Reprints

(available about mid-month)

FS-736 Insect and Rodent Prospects for 1958
FS-737 Livestock Disease Situation—1958
FS-738 Plant Disease Outlook for 1958
FS-739 Crop Varieties for 1958
FS-740 Iowa Farm Custom Rates for 1958
FS-741 Crop Prospects for 1958

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1958 Outlook Issue

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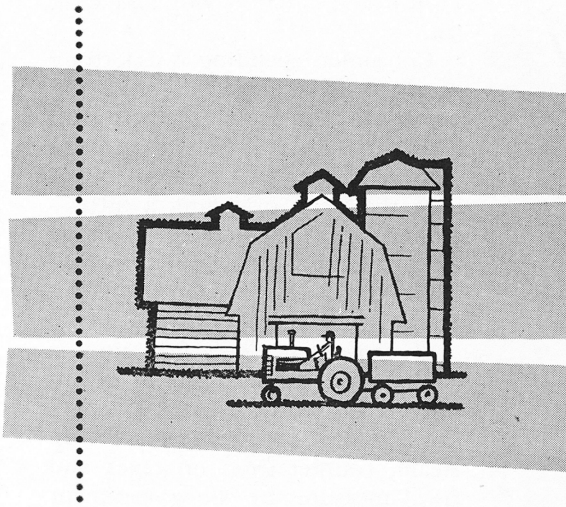
Farm Outlook for 1958



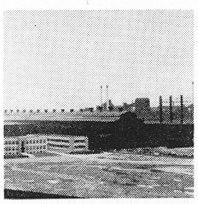
Marketings of farm products will be somewhat larger in 1958 than in 1957. So total cash income should be up a little. But another rise in farm costs will probably cancel out most of the increase.

AS THE general economy enters 1958, it's essentially in a "sidewise" movement. There's no strong general trend either up or down. And the individual items making up the economy are mixed. Some are rising; some are steady; some are falling.

Under the circumstances, the most likely farm outlook for the coming year is a demand for farm products about the same as in the year just ended. (But this is by no means certain. There definitely is risk on the demand side this year.)

A sidewise movement is likely to bring some rise in unemployment. But a big downturn would require a spreading of the slump to all sections of the economy. This doesn't seem imminent at present.

Economic growth during 1957 was relatively small. The Gross National Product—the value of all goods and services produced—rose by about 20 billion dollars. But most of the gain was the result of increased prices. Real output was up somewhere around 1½ to 2 percent—in contrast to a 3-percent boost in the previous year. (A 3-percent rise in real output is considered normal economic growth.)



Business

The current "hesitation" in business is largely the result of a downturn in the "producer-durable-goods" industries—that is, the industries which produce factory machinery and equipment. This industry started to fall off in the latter part of 1957. Further drops are expected in 1958.

The downturn in factory machinery and equipment stems from the rapid expansion of spending for this purpose in the last several years. We now have our total factory capacity built up to the point where many companies are going to let things ride for awhile until orders catch up with their capacity.

On the other hand, house building has been lagging for the last 2 years. Now it shows signs of coming out of the doldrums. Some upturn is likely in 1958; the departments of Commerce and Labor expect an 8-percent advance. More rental units are expected to go up as well as private homes.

Most other construction is expected to hold steady. Industrial construction is expected to drop, however, along with the drop in spending for factory equipment.

Meanwhile, the rise in business inventories is slowing down. Overextended inventories were the big cause of the 1954 recession. Inventories aren't likely to change much in 1958 since they aren't out of line with sales.

On the other hand, government buying of goods and services is likely to expand. Sputnik has forced a reappraisal of the national security budget. (Nondefense items may be cut some in 1958, however.) And state and local government expansion of spending has not yet run its course. Some further rise is likely. Thus, government in total is a force on the up side in the coming year.

But the increases in spending for housing and by the government aren't enough to offset the drop in "producer durable goods." So the biggest uncertainty in 1958 is what consumers will do. In the 1954 recession, consumers held up their spending. In fact, they increased buying. This was accomplished by an increase in consumer credit, a

drop in the rate of saving and a tax cut.

Consumer spending was strong in 1957. Though the rate of saving out of current income is lower than a year ago, it's still well above what it was in 1955. If consumers cut back their rate of saving a little—along with the increase in wage rates scheduled for 1958—the result could be no downturn of consequence this year.

If consumers don't take up the slack, however, then a mild downturn is in prospect for 1958. If the downturn drags on or picks up steam, counteraction on taxes and fiscal measures by the government should be able to prevent a prolonged or severe contraction.

But the odds are that any downturn won't be severe enough to greatly affect demand for most farm products.

So-called "luxury items" will be affected most. Demand for appliances may also slip a bit. Best bet, therefore, is for demand for farm products to be about the same in 1958 as in 1957. The premium of prime beef over choice could be affected, however, if the amount of dining out at "fancy places" slips. This is in contrast to a year ago when the improved demand for farm products was a factor in the rising cattle and hog prices of the spring of 1957.

Farm Exports . . .

Shipments of farm products abroad the past year set a new high of 4.7 billion dollars. Prospects in the current year are not quite so good. A drop of around 15 percent—to about 4 billion dollars—is expected. The prospective drop will come mainly in wheat, cotton and rice. Shipments of these three were unusually large last year.

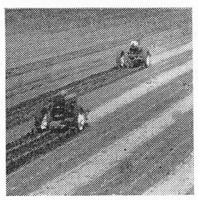
Cotton, for example, benefited from a new export program along with deferred demand on the part of foreign buyers—who had held back in anticipation of the lower prices of the new program. There will be no such backed-up demand to help the current export of cotton.

Wheat harvest was poor in Europe in 1956. So more wheat was imported by countries in that area. Crops there were good in 1957. Special export programs pushed rice shipments last year.

Also, some foreign countries don't have as large a dollar exchange this year. This will cause some cutback in buying of farm products.

Exports of soybeans and feed grains, meanwhile, should be larger than in the past year—but not enough to offset the smaller shipments of rice, cotton and wheat.

The effect of the reduced exports on farm prices, however, will not be appreciable. The large 1957 shipments were made mainly out of government stocks. The main effect during the past year, therefore, was to reduce government stocks rather than to boost farm prices. The cutback in 1957-58, likewise, will be mainly out of government stocks.



Income and Costs

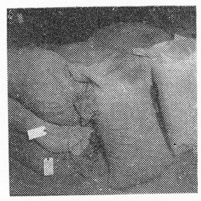
Farm marketings will be a little larger in 1958 than in 1957. Thus, total cash income for the nation may be up a bit, too. But higher costs are expected to cancel out most or all of the increase.

Farmers who were burned out by the 1956 drouth will do better, however, as individuals. They'll have a substantial rise in marketings—enough to more than offset the rising costs. This is the situation of many farmers in central and western Iowa.

Costs of things farmers buy have been rising for the past 2 years. Costs averaged 4 percent higher in 1957 than in 1956. Since 1947-49, costs have gone up about a fifth.

Present indications are that costs will rise again in 1958. But the rise likely will be less than in 1957. Price tags of factory-produced items used in farming aren't expected to go up as much as in the last 2 years. There'll be some rise in items made of steel. Wages and taxes are likely to go up. Feeder cattle will average higher, too, than in 1957—unless we have a drouth.

On the other hand, feed costs will be the same to lower. Many of the grass and legume seeds will cost less, too.



Feed Grains

Corn, barley and grain sorghum supplies are at record levels. Price supports are lower than in 1956. And corn moisture is high. The net result: lower feed prices.

Despite the unfavorable 1957 fall harvesting weather, we have feed almost running out of our ears. The moisture condition of much of the 1957 large corn and grain sorghum production is such that it will have to be fed—or dried artificially—before warm weather sets in. This puts pressure on prices.

We could see a very "soft" corn market late this winter and spring when this off-quality corn moves. Then, prices could stiffen again after the distress corn moves.

But with the USDA planning to sell even more CCC corn than in 1957 and with some artificially dried 1957 corn available, no strong summer price advance seems likely, unless the 1958 growing season is poor.

There's less cottonseed meal available than a year ago. But this is more than offset by the larger soybean crop. So protein feeds should remain relatively cheap.

The longer-range feed-grain outlook is this: How much longer can we keep the build-up in feed grain supplies from spilling over into increased livestock production? Carryover of all feed grains next fall will be up another 8 million tons or so! This can't go on! *Either* we'll have to find some effective way to hold feed grain production in check, *or* we'll wind up with large supplies of livestock and lower livestock prices.

Meat . . .

Livestock slaughter and meat output in 1957 dropped about 3 percent from 1956. And with more people to eat this smaller supply of meat, consumption per person slumped to 159 pounds, compared with the record of 166 pounds in 1956.

This 7-pound-per-person drop gave a strong upward push to 1957 hog and cattle prices. It was helped along by stronger buying power. (It's significant, however, that the 1957 supply of meat per person still ranked as third largest since 1907.)

Last year's cutback in meat was divided equally between beef and pork. The drop in pork came in the first half of the year; the drop in beef in the second half.

Looking ahead in 1958, prospects are for larger pig crops. This will push pork supplies up. But supplies per person during the first half of 1958 won't be up sizably. The main boost will come in the second half of the year when the larger 1958 spring pig crop moves to market.

Total 1958 beef and veal supplies will be lower—assuming no major drouth or business recession. Cattle numbers are lower than a year ago. And with lots of feed and stiffening prices of grass cattle, there's incentive to hold back numbers. This will be only partly offset by feeding cattle to heavier weights. There won't be much change in lamb and mutton consumption.

So the combined supply of meat per person in 1958 probably will be slightly smaller than in 1957—probably around a pound less. More pork; but less beef and veal.

Hogs

Hog production began to turn upward in the fall of 1957. Early indications were for a 10-percent-higher 1958 spring pig crop. Main boost probably will be in the late spring pigs. First reports of intentions of winter and early spring pigs pointed to a 7-percent boost.

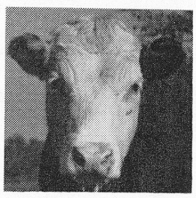
Cheap corn—with lots of moisture in it—along with strong hog prices gave a very favorable hog-corn ratio during the breeding season of late 1957.

Hog slaughter during the first 4 or 5 months of 1958 will be only slightly larger than a year ago. Thus, hog prices should be nearly as high as last year at that time.

But the 1958 spring pig crop will be substantially larger. This means increasing hog slaughter during summer and fall. Hog prices normally don't show late summer strength in years when hog production is increasing. Thus, chances are that the price peak will come earlier in the year than the August top of 1957.

Late summer and early fall will see the start of the fall price downturn. This downturn probably will be sharper than a year ago. It will pull hog prices down to the 12- to 14-cent area by late fall *if* the 10-percent or more boost in the 1958 spring pig crop is realized.

A large corn crop again in 1958 will lay the groundwork for another boost in hog production in 1959. It would give an average hog-corn feeding ratio next fall, even with cheaper hogs. In this case, we *could* have some *really low* hog prices by December of next year.



Cattle

Total cattle numbers on Jan. 1, 1958, probably were a little lower than on the same date a year earlier. Slaughter was heavy last year—though not quite as large as in 1956. The improved forage situation coupled with the stronger prices for grass cattle this fall has created a strong incentive to expand cattle numbers. Thus the downturn in the current cattle cycle isn't likely to run nearly as long as in most past cycles.

The only way that the downturn in cattle numbers can be halted, however, is for cattle slaughter to drop off. Thus, the next few years will be ones of smaller cattle slaughter than the last two.

But this doesn't necessarily mean that we'll have fewer fed cattle. For cattle feeders can bid strongly enough to get most of the lower grade cattle—bid them away from the killers. That's what happened last fall. Thus, the supply of fed cattle coming to market in 1958 isn't likely to be any lower, and could be higher, than in 1957. And with lots of cheap feed, the cattle are likely to be fed to heavier weights. Discounts for heavy weight could be a real problem later this winter and spring.

The strong demand for feeder cattle is likely to create a narrow margin between feeder and fat cattle the next few years. So most of the gains from cheaper feed are likely to gravitate to the man who raises the cattle. The beef cow man should fare better than the cattle feeder the next couple of years.

Greatest danger in the 1958 fed cattle market at this time appears to be late this winter and spring. Large numbers of cattle are being wintered on wheat pastures and grain sorghum stubble in the Southwest. And a lot of native cattle will get some grain this winter. Both of these two sources will be suppliers of beef late this winter and early spring. In addition, the heavier weight of yearlings put on feed this past fall points to earlier marketings of these cattle this spring.

It adds up to bunched spring marketings and a real chance of depressed prices for underfinished cattle. At the same time, there may be a penalty for heavy weight on upper grade cattle.

Once we're past this spring market, there should be a normal seasonal advance in fed cattle prices—assuming no substantial change in consumer demand. And in that case, we can look for even higher feeder cattle prices next summer and fall than in 1957. For with average weather, cheap feed prices will be with us again next fall.

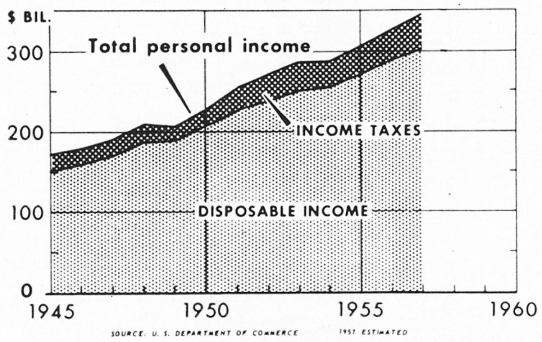
Sheep

Sheep and lamb prices averaged higher in 1957 than in 1956. This is partly the result of continued shrink in numbers—but more the result of the rise in the price of all livestock.

There has been a strong demand

U.S. Market for Farm Products To Continue Strong

INCOME CLIMBS TO ANOTHER NEW RECORD IN 1957

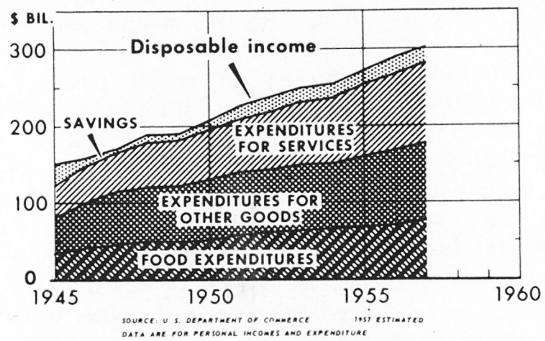


U. S. DEPARTMENT OF AGRICULTURE NEG. 1001-57 (10) AGRICULTURAL MARKETING SERVICE

The domestic market for food and other farm products has been strong over the past year and should continue so in 1958. The total income consumers have to spend, after taxes, has been running about 5 percent above a year earlier. Although the population has grown and prices are higher, purchasing power per person is about the same as a year ago. A continued high level of income is expected next year.

Consumer expenditures also have increased this year though spending for durable goods, particularly automobiles and appliances, has not risen significantly. Food spending has gone up at about the same rate as income. As in other recent years, much of the increase in food spending has been absorbed by additional services and the higher costs of services connected with food. The farmer's share of the retail food dollar in 1957 is estimated at 40 cents, the same as last year. This was the first year since 1951 that the farmer's share did not decline.

CONSUMERS AGAIN SPEND ABOUT FOURTH OF INCOME FOR FOOD



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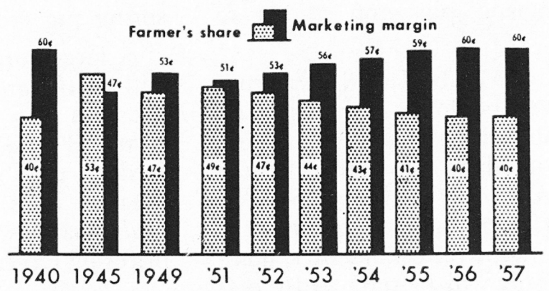
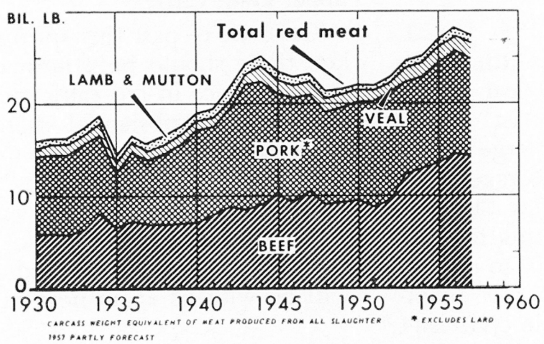
FARM SHARE OF FOOD DOLLAR HOLDS AT 40 CENTS



U. S. DEPARTMENT OF AGRICULTURE NEG. 1861A-57 (10) AGRICULTURAL MARKETING SERVICE

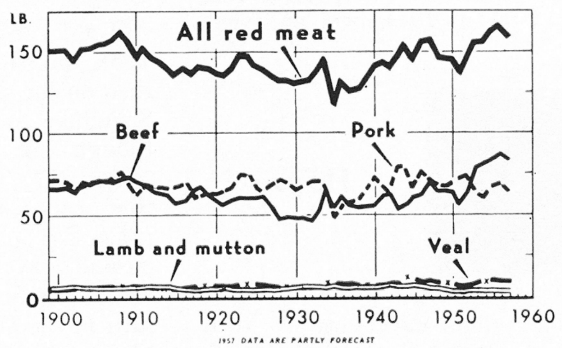
Beef To Hold 1957 Price Gains but Decline Likely for Pork

MEAT OUTPUT DOWN IN 1957 BUT FAR ABOVE AVERAGE



U. S. DEPARTMENT OF AGRICULTURE NEG. 1698-57 (9) AGRICULTURAL MARKETING SERVICE

MEAT CONSUMPTION PER PERSON EASING DOWN



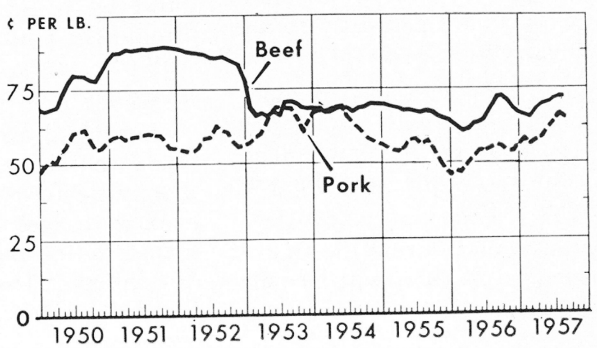
U. S. DEPARTMENT OF AGRICULTURE NEG. 425-57 (9)

Production of both beef and pork decreased in 1957. Production and consumption of beef were still much above average in 1957, as the decline began from a very high mark in 1956. Pork consumption per person, however, was lower in 1957 than in any year since 1938 except 1954.

Retail prices of both meats increased in 1957. Beef prices remained well below previous highs, but pork prices approached earlier peaks.

Total meat production may not change a great deal in 1958. Beef output will likely be down. Pork output probably will increase a little in the first half and much more in the second half. Retail beef prices accordingly are expected to average a little higher in 1958. Pork prices are likely to be lower, especially in the second half year.

RETAIL PRICES OF PORK, CHOICE BEEF INCREASE DURING 1957



U. S. DEPARTMENT OF AGRICULTURE NEG. 3619A-57 (9) AGRICULTURAL MARKETING SERVICE

for ewes this past fall. It could mean the end of the nearly stable sheep population which has held since 1950. Any increase isn't likely to be enough to change the sheep outlook, however. The outlook is for relatively good profits from a well-managed native ewe flock.

The beef outlook is good for the next few years, and sheep generally fare well when cattle do. In addition, the wool incentive payment program will support the returns from wool.

Dairy

Fewer cows, more milk per cow, rising total milk production, more milk than can be sold at market prices and government taking up the balance to support dairy prices. That was the dairy situation in 1957. It's likely to continue to be the situation in 1958.

Since 1952, average dairy production per cow has been rising at the rate of about 2 percent per year. The number of milk cows has been slipping downward since 1944 (except for a brief increase in 1953). Total milk production last year hit 127 billion pounds—up 1.3 billion from 1956. About 5 billion pounds of this was bought by the USDA to support prices.

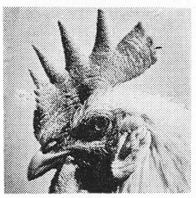
Prospects are for another increase of 1 to 2 billion pounds of milk produced this year. The increase in population will little more than absorb this hike in milk output. With no increase in consumer income likely, this leaves a continued surplus of around 5 billion pounds to be taken off the market by the government for price-support purposes.

A milk surplus at prevailing prices promises to be with us for awhile. So the 1958 dairy outlook boils down to the decision of the Secretary of Agriculture over the level of price supports for the year beginning April 1. Feed costs will average a little lower than in 1957, however.

Some further decrease in the number of dairy cows is likely as the current trends continue. But they'll be the poorer producers. The trend is also to larger, more specialized dairy herds. Milk production per cow also will continue to rise. However, there are enough dairy heifers available to increase milk cow numbers if dairymen desire.

One of the differences in the dairy outlook is the improved beef credit side. Both cull cows and veal calves will sell better than in the last few years because of the reduction in total amount of beef available and also because of the relatively greater decrease in lower grade beef.

This should make the steering of Holstein and Brown Swiss bull calves profitable where a farmer has extra roughage and grain to sell.



Poultry

Things look a lot better in the poultry business this winter than the situation of a year ago. Prices last year were the lowest since the early 1940's.

The big reason for the change in the egg picture lies in lower egg output. Poultrymen took out about a fifth fewer chicks last spring. They didn't cull quite as heavily, and more yearling hens were carried over. The result: Total number of layers on farms Jan. 1, 1958, probably was down around 5 percent.

And, in turn, egg production is down by around that amount. This will hold egg prices above the low levels of last year. Coupled with cheaper feed, this means better egg profits.

This should encourage an increase in the number of chicks bought in the spring of 1958. But some increase is needed just to offset the large number of older hens carried over. And with fewer pullets raised last year, there'll be less opportunity to carry over yearling hens this fall.

The USDA estimates that 15 million more young pullets could be raised this year without creating a net addition to the laying flock a year from now.

Thus, while egg prices may not be quite as good a year from now as this winter, they should continue on the profitable side.

Fewer turkeys are likely to be raised in 1958. The record 1957 crop sold at the lowest prices in 15 years. And a large storage stock of turkey will influence turkey prices in early 1958.

But if the turkey crop is down moderately (5 percent or so) some improvement in turkey prices will prevail next fall. Early indications are that the cut will be mainly in light-breed turkeys and in white-feathered heavy breeds. There's little early sign of any significant cut in bronze turkeys. If this develops later, the 1958 turkey outlook will improve further.

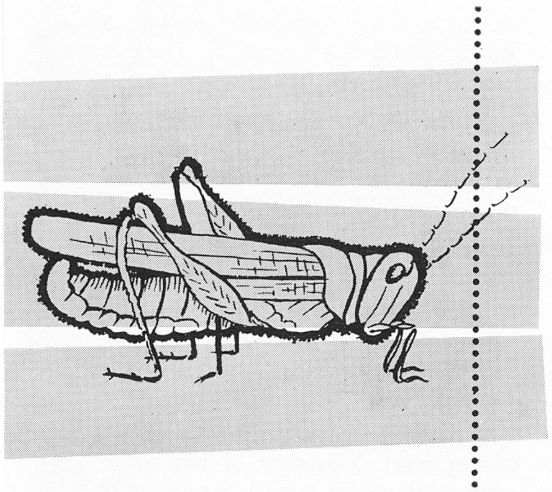
Land Values

Farm land prices have been going up over the Midwest for the last 4 years—despite the drop in farm income. This is the longest two-way trend in land prices and farm income in 45 years of record!

The pressure to enlarge existing farms is one big reason behind the two-way trend. A farmer who needs an extra 80 or 120 acres of cropland to make a more economic-sized unit can bid more than anyone else for land.

Such a farmer looks at the additional cost of working the extra cropland. He sees only fuel, seed and fertilizer costs. In most cases, he has the machinery and labor already available. So the returns to him from buying an extra piece of land to hook onto his present farm are greater than the *average* return from land.

The pressure to enlarge existing farms will continue for several years. Thus the forces which have pushed land values up for the last several years will continue into 1958. But the rise in land values may be a little less.



Insect and Rodent Prospects for 1958

Insect outbreaks depend largely on the weather during the growing season. Temperature, rainfall, soil moisture and humidity all are important. Here's the forecast for 1958, depending on the weather.

by Harold Gunderson and J. H. Lilly

IOWA STATE College forecasts of insect activities are based on insect populations at the time the forecast is made and indicate the greatest infestation possible. We know about how large a given insect population is, and the forecast is based on what will happen if that population survives normally. Any factor that reduces the population reduces the problem.

This is particularly true of insects which are surveyed in the egg stage. For example, we survey grasshopper egg populations in the fall. Results of this survey indicate the greatest population which can be present next summer, and warnings of grasshopper outbreaks are based on this maximum possibility. But any farm operation that exposes grasshopper eggs to predators or buries grasshopper eggs deeply will reduce the population to some extent. Two weeks of warm, humid weather soon after the eggs have been hatched in May and June will almost always kill a large percentage of the grasshopper population because of fungus disease.

Some of our other surveys, like that for the corn borer, determine the number of overwintering forms which may reproduce during the coming summer. In these cases, prediction becomes even more risky because weather conditions may greatly affect both rate of reproduction and survival of the young. Still other predictions are based on complexes of insects, some of which are bound to be present each year.

For formal surveys, the procedures used to determine an insect population have been established by years of research and practice. We make formal surveys of the European corn borer, the chinch bug and grasshoppers. We record the average number of corn borer larvae per plant in the fall, the number of overwintering adult chinch bugs per square foot of blue stem bunch grass (in which the chinch bug prefers to spend the winter) and the number of grasshopper egg pods per square foot of soil.

We continually make observational summertime surveys on a large number of insects. These are conducted while entomologists go about their regular work throughout the summer. Surveys of this type are made on the potato leafhopper, the spotted alfalfa aphid, the corn rootworm and livestock pests of various kinds.

What Happened in '57

Here's a brief review of insect conditions in 1957. In the fall of 1956 we had as many grasshopper eggs in the soil as we had in the fall of 1955—just before the outbreak of 1956. We warned that there was a chance that grasshoppers would be abundant in 1957 throughout the state. But weather conditions in 1957 greatly reduced grasshopper populations so that fewer than 500,000 acres were treated with insecticides to control grasshoppers—more than 2½ million acres were treated in 1956.

In the fall of 1956 the spotted alfalfa aphid was probably present in every Iowa county. It did no real damage but we were afraid of what it might do in 1957. However, 1957 weather conditions were against the establishment of this insect.

The European corn borer had a good year. Corn growing conditions were favorable for both broods. Only a small percentage of Iowa farmers treated for borers in 1957. About 75 percent of those who treated used sprays; 25 percent used the DDT granular formulation developed here in Iowa. Results were generally good with both treatments.

The corn earworm is an annual pest of all kinds of corn. In some years field corn is very heavily infested, but this was not consistently true in 1957. Sweetcorn had its usual infestation of one worm per ear (you don't often find more than that because the stronger worms eat any weaker worms present).

No predictions were made on the garden webworm for 1957. This insect feeds on alfalfa, clover and a number of other crops. In 1957

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it was a regional problem which destroyed a lot of alfalfa and clover in Iowa and surrounding states.

The potato leafhopper—a small, wedge-shaped, yellowish-green sucking insect—migrates into Iowa from the south each spring. Normally the population builds up rather slowly. In 1957, however, leafhopper populations increased with almost explosive force. A lot of damage was done to second-crop alfalfa, particularly in the southern half of the state. These leafhoppers were household pests throughout the summer since they're attracted to lights and are small enough to get through screens. The potato leafhopper also feeds on garden beans, potatoes and tomatoes and caused a lot of garden damage in 1957.

The Mexican bean beetle, present along the Mississippi River for years, is slowly moving westward. In 1957 it was found for the first time in Davis County.

The Colorado potato beetle is back. For 75 years this insect was the major pest on potatoes. After the introduction of DDT the Colorado potato beetle practically disappeared, but in 1957 it suddenly appeared in large numbers. Beetles were reported in gardens all over the state, and we found them feeding on wild members of the potato family in pastures and fencerows. Since we have made almost no observations on this beetle for 10 years, we don't know where the insect has been, why it suddenly appeared in 1957 or what it will do in 1958.

There are no good forecasting methods for insects attacking shade trees and ornamentals. In 1957 our populations of bagworms, green-striped maple worms, walnut caterpillars, elm aphids and willow aphids were much higher than normal. The spring cankerworm on elm was only a minor problem.

In the area of livestock insects, horn fly and stable fly populations were about normal in 1957—very annoying. Sheep scab increased sharply in Iowa flocks in 1957, and screwworm outbreaks were reported from many parts of the state.

The adult of the screwworm is a blowfly with a red head which lays its eggs in wounds. The maggots feed in and enlarge the wound, frequently causing death of the infested animal. This insect overwinters only in the Gulf Coast area and is brought into Iowa as maggots in wounds of livestock shipped north in the spring. Natural migration of the adults northward also brings the insect into Iowa in late August and September. We assume that in 1957 the infestation came early in the summer on livestock.

Rodent populations held steady throughout the 1957 season.

Prospects for 1958 . . .

Now what about 1958? The table indicates what might happen, depending on weather conditions.

Iowans now have two new pest problems to worry about. One of these is the Japanese beetle. This insect has been a major pest of lawns, gardens, orchards and field crops in many eastern states for a long time. In 1957 a number of adult beetles were trapped in and near the city of Fort Madison in Lee County.

An attempt will be made in the spring of 1958 to eradicate this population by widespread chemical control. But even if the attempt is successful, the threat of Japanese beetle infestation will continue in Iowa. Adult Japanese beetles feed on the foliage and fruit of many trees, shrubs and garden plants. Eggs are laid in sod, and the larvae may seriously damage lawns and pastures. Control requires applying insecticides in the soil to kill the larvae and on foliage and fruit of trees and shrubs to kill the adults.

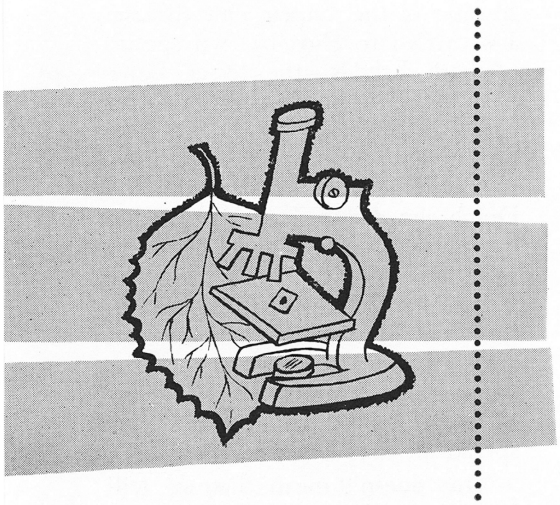
The other new problem for Iowans is the Dutch elm disease. It's carried to elms by two species of bark beetles—the lesser European elm bark beetle and the native elm bark beetle. Both of these beetles have been present in Iowa for a long time. Meanwhile the Dutch elm disease has been steadily moving westward since its discovery in Ohio in 1930. To date the disease has been confirmed only in the Fort Madison and Davenport areas of Iowa. However, on the basis of its progress in the East, we must assume that it will slowly spread all over Iowa.

This doesn't mean that we will lose all our elms. But it does mean that we must do a better job of caring for them. Weakened, dead or dying elm trees in which the bark beetle populations will build up must be removed and destroyed promptly. Prune out dead branches, repair bark injuries, and fertilize and water trees to keep them growing vigorously. These procedures will be important in the next few years because thousands of shade trees may die as a delayed result of severe drouth in 1954-56. As these trees die, remove them before bark beetles can breed in them.

On the brighter side, we think that cattle grubs can eventually be eradicated. A new insecticide has just been federally approved which may help accomplish this. This insecticide, Trolene (ET-57), is given internally to cattle and is carried to all parts of the body. It kills cattle grubs before they reach the back where they damage the hide. Widespread use of this systemic insecticide may well result in the eradication of cattle grubs from the United States.

Prospects for some common insects, Iowa, 1958.

Pest	Weather		
	Dry	Normal	Wet
European corn borer	**Heavy**	**Severe**	Moderate
Chinch bug	Moderate	No problem	No problem
Grasshoppers	Moderate	Little problem	No problem
Spotted alfalfa aphid	Light	No problem	No problem
Cutworms	Light	Light	Moderate
Potato leafhopper	**Severe**	Moderate	Light
White grubs (SE Iowa)	Moderate	Moderate	Moderate
Flies on livestock	Moderate	**Severe**	**Heavy**
Mosquitoes	Light	**Heavy**	**Very severe**
Stored grain insects	Moderate	Moderate	**Heavy**



Plant Disease Outlook for 1958

Plant diseases take a yearly toll in reduced vigor, yields and quality of crops. If everyone used the best-known methods of control, this loss could be reduced by approximately 25 percent.

by Malcolm C. Shurtleff

PLANT DISEASES aren't new. They've been causing losses to all types of crops since the earliest records of man.

The true nature and cause of plant diseases have been clouded by superstitions, dogmas and false interpretations up to modern times. Yet in the last 100 years, the modern science of plant pathology has discovered many of the causes and cures for plant diseases.

But old and new diseases still infect our crops. For example, it has been estimated that diseases reduced Iowa's oat yields by about 32.6 percent of the potential yield for the 10-year period, 1945-54. That amounts to almost 18 bushels per acre! If the price of oats had remained constant at 70 cents a bushel during this period and if the oat acreage had been maintained at 6 million, this Iowa loss to oat diseases alone would have amounted to over 75 million dollars each year.

MALCOLM C. SHURTLEFF is assistant professor of plant pathology.

Cost of Diseases . . .

Plant diseases rob American farmers and consumers every year by reducing the vigor, yield and quality of crops. The following excerpt from a table in "Losses in Agriculture" prepared by the Agricultural Research Service, USDA, compares the average disease losses of some major field crops grown in the United States during a 10-year period.

Crop	Average loss in production (1943-52)
Oats	21.3%
Sugar beets	16.9%
Soybeans	12.5%
Sorghum	8.3%
Wheat	6.6%
Rye	5.9%
Barley	5.0%
Corn	4.8%

Plant diseases now are controlled largely by scientifically bred resistant varieties, carefully grown seed stocks and carefully timed applications of preventative fungi-

Prospects for Some Common Plant Diseases in 1958, Depending on the Amount of Rainfall During Spring and Summer.

Crop	Disease	Wet spring and/or summer	Normal spring and/or summer	Dry spring and/or summer
Field crops, vegetables, flowers	Stem and root rots, leaf spots and blights, seed rot, damping-off	Heavy	Light to moderate	Trouble doubtful
Oats	Rusts, Septoria	Heavy	Light to heavy	Trouble doubtful
Wheat, barley	Rusts, scab	Heavy	Light to heavy	Trouble doubtful
Corn	Leaf blight	Moderate	Light	Trouble doubtful
Soybeans	Foliage diseases	Heavy	Light	Trouble doubtful
Potatoes, tomatoes	Blights	Heavy	Light	Trouble doubtful
Vine crops	Leaf spots, blights	Moderate	Light	Trouble doubtful
Apples, pears	Scab, fire blight	Heavy	Moderate to heavy	Light to moderate
Grapes	Black rot, downy mildew	Heavy	Light to heavy	Light
Strawberries	Foliage diseases, root rot	Heavy	Light to moderate	Light
Raspberries	Anthracnose, cane blight	Heavy	Light to moderate	Light
Trees, shrubs	Leaf spots, blights	Heavy	Light to moderate	Trouble doubtful
Evergreens	Browning, needle drop	Doubtful	Light	Moderate to heavy

cides. This control, however, is only 50 percent effective. If everyone practiced the best known methods of control, we could increase the effective control to about 75 percent. To prevent the remaining 25-percent loss will require new methods, new chemicals, new equipment, new crop varieties and better cultural practices.

Weather Important . . .

Plant diseases are greatly influenced by the weather. How severe plant diseases will be in 1958 depends largely on the amount and frequency of rainfall this coming spring and summer. In cool, wet years diseases are generally much more important than in warm, dry seasons—though considerable loss occurs every year.

Certain inconspicuous or "hidden" diseases appear every year. Unless a loss from these diseases is striking, such things as the weather, poor seed, condition of seedbed, depth and time of planting, poor fertility, etc., usually get blamed—when, actually, disease is the real culprit.

From careful study of records and field observations, plant pathologists can predict future outbreaks of disease with some degree of accuracy. Long-range weather forecasting, 30 days in advance, is helping in this respect. The table gives some idea of the prospects for 1958—depending on the weather—for outbreaks of our most common Iowa plant diseases.

What You Can Do . . .

Though exact predictions of disease outbreaks are impossible, you can keep your losses at a minimum, regardless of weather, by doing as many of the following as practical:

1. Plant only highest quality seed or plant stock of recommended varieties. Use certified or disease-free seed whenever possible.

2. Use disease-resistant varieties where available and adapted to Iowa. Use more than one variety.

3. Clean and chemically treat seed of cereals, grasses, vegetables and flowers.

4. Plant crops at recommended times in a well-prepared seedbed. Carry out recommended cultural practices.

5. Practice a sound crop rotation and sanitation program. Remove and burn crop debris in the fall or plow it under deeply and cleanly.

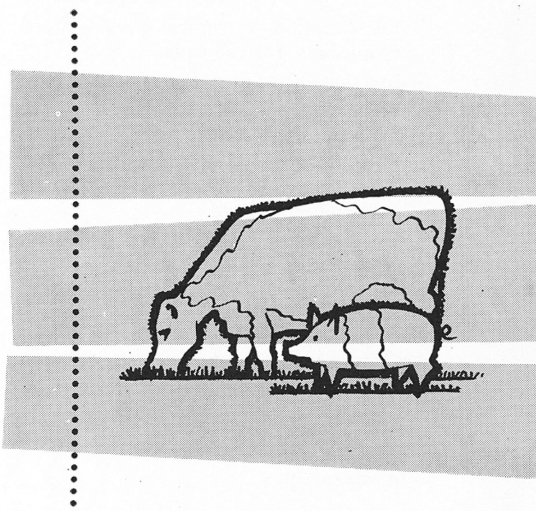
6. Avoid excessive mechanical injury when cultivating, harvesting, storing, etc.

7. Use *protective* fungicide sprays or dusts (preferably applied just before wet periods) on fruits, vegetables and ornamentals which have had foliage and fruit diseases in the past. Apply materials correctly—often enough, at the right time and thoroughly.

8. Keep down weeds and insects which may harbor disease-producing organisms.

Livestock Disease Situation -- 1958

With the changes taking place in agriculture today, livestock disease control is becoming more important—both because of narrowed margins and from the standpoint of quality improvement.



by John B. Herrick

IOWA had no major outbreaks of livestock diseases in 1957. Much of this good fortune is due to the work of the regulatory and practicing veterinarians. These people—who maintain the quarantines, health regulations and interstate restrictions on the movement of livestock—help make Iowa one of the safest places in the world for raising livestock.

And Iowa has more veterinarians in practice than ever before. There isn't a farm in the state that doesn't have easily obtainable veterinary service.

Also, during 1957 the Iowa legislature passed two new brucellosis laws which will aid us in becoming an accredited state.

But the toll from livestock diseases is still great. Swine erysipelas, parasites, shipping fever, mastitis, poultry diseases, leptospirosis and several other common diseases are prevalent. Lack of

JOHN B. HERRICK is professor and extension veterinarian.

sound management coupled with failure to use available veterinary service is responsible for much of the loss from these diseases.

Misleading advice is still accepted by many livestock men. Overpowering advertisements and high pressure sales by "modern medicine men" are plentiful—with more interest in the livestock man's money than in the health of his livestock.

Keeping accurate records on livestock losses would be a great aid in reducing disease losses in the state. Records should be kept not only of mortality losses—that is, actual death loss of animals—but also of morbidity losses. These morbidity losses include:

—Reduced yield and depreciation of animal products—eggs, hide, wool, casings and the cost of medicinal preparations.
—Condemnation of parts and carcasses at slaughter.
—Waste of feed, labor and space.
—Interference with breeding and reproduction, reduced litter size, abortions, etc.
—Reduced quality of animals, lower grades of animals and reduced sale values.
—Lower efficiency of work animals.
—Depreciation of capital items—breeder animals, for example.
—Inefficient use of pastures.
—Lowered resistance of diseased animals to other diseases.
—Diseases of animals transmissible to man resulting in death, suffering, man-hours lost, etc.
—Expenditures for worthless or inefficient drugs.

The modern livestock producer must keep these points in mind when thinking of disease control. If every livestock producer kept accurate records of these losses, the incidence of disease would lessen considerably.

Problems for 1958

● Increased attention will be given to brucellosis control. Restrictions on the movement of cattle has prompted more blood testing than ever before. In the next year, several Iowa counties will circulate petitions to clean up brucellosis in the entire county. This is for your safety.

● More emphasis will be placed on mastitis control because of the problem of antibiotics in milk obtained and sold from treated quarters. This is the dairymen's responsibility and should be handled by them before restrictions and adverse publicity develop. The Pure Food and Drug Administration—the agency that safeguards our food industry—has found increasing amounts of antibiotics in milk. Recommendations have been set forth to prevent this adulteration practice. These should be strictly followed. They are not penalties but are to protect the dairy industry.

● A second look should be given to the cost and the value of medicated feeds. This is true not only for the poultry industry but also for livestock enterprises. Sound management practices and veterinary medicine used to prevent disease outbreaks are cheaper and sounder practices in the long run.

● Leptospirosis is widespread and is one of the major diseases in cattle and swine. Vaccination is increasing in popularity as a preventative.

● Systemic grubacides — products that can be fed or sprayed on cattle to kill grubs in the animal's tissues—are being thoroughly investigated and look promising. Limited amounts of at least one form will be available in 1958.

● Tranquilizers for nervous animals have been used for the unruly heifer and cow, the nervous bull and sometimes on feedlot cattle. A word of caution: These drugs act differently on different animals. They have side effects and should not be used indiscriminately.

● It's extremely important to follow recommendations for the proper use of external pesticides on livestock. Many of the products formerly used are no longer recommended because they adulterate meat and milk. These recommendations should be closely followed for your own protection and the protection of the consumer.

● Bloat is one of our continuing problems. A "sure" bloat preventative has not been found. Continued research may unveil one in the near future.

● Iowa still needs an animal disease reporting system and stricter regulations on the movement of diseased animals.

● The perennial problem of livestock owners buying "easy cures" or "sure disease preventatives" and other such products where research has revealed and recommended different approaches will still exist in Iowa during 1958. Education holds the answer to this problem.

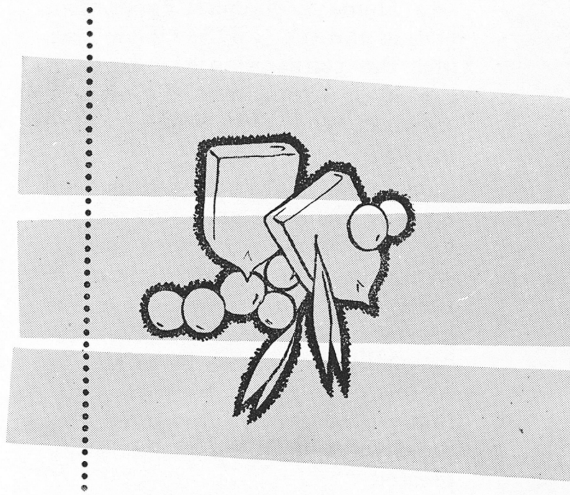
New Trends . . .

No disease was ever eradicated without legislation and education. Tick fever, glanders, foot and mouth, tuberculosis and other diseases were eradicated in the United States by the use of these two methods. Brucellosis eradication is underway now, and programs for controlling other diseases are being set up. National committees are studying ways and means of eradicating hog cholera. As time passes, other diseases will be handled similarly. These movements are for your protection. It's sound business to spend $5 once to eradicate a disease rather than to spend $1 every year to merely control it.

Quality and efficiency are the key words in livestock production in our changing agriculture. Quality meat, eggs and milk can be produced only from healthy animals. In gearing livestock production, the producer of today must realize that quality will help keep the consuming public after his product. Thus, sanitary surroundings and balanced rations, coupled with sound disease control programs, will keep the Iowa producer on a sound footing.

Outlook "Bright" . . .

In general, the disease control outlook for 1958 is on the bright side. The livestock industry has at its disposal ample veterinary service, consultation facilities and incentive to control livestock diseases. But Iowa still suffers its share of the 1,882-million-dollar annual loss estimated for the United States. To cut down this loss, we need to continue to follow sound disease control practices on all farms.



Crop Varieties for 1958

The use of high-quality seed of recommended varieties is an important part of good farming—and adds little to cost. These recommended varieties are based on years of testing and research.

by I. J. Johnson and W. H. Bragonier

THE CHOICE of a crop variety is one of the important decisions that farmers must make. Active crop improvement programs in Iowa and other states produce many new varieties each year. These newer varieties usually are an improvement over the older ones, but their true merit can only be determined after several years of careful testing in various areas of the state.

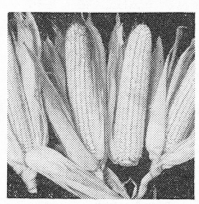
Crop varieties produced by the College have been tested for several years before seed is increased and made available to the public. But even with this careful procedure, occasionally a variety may not fulfill its original promise because of new diseases or other factors not present during the testing program.

Each year complete up-to-date reports are made of variety trials for different crops. These reports are available from your county extension director or from the Publications Distribution Room, Iowa State College. This information should aid you in making decisions on crop varieties to grow in 1958.

The crop varieties listed are eligible for production as certified seed. Many growers in your community as well as seed companies have certified seed for sale. You can obtain a list of seed growers from your county extension office.

In addition to choosing the best varieties to meet your needs, it's important to be sure you have high-quality seed. It pays to examine the seed you buy carefully to see that it's properly labeled, that it has high purity and germination and is free from noxious and other weed seeds. Many seed dealers in Iowa handle such high-quality seed.

Though the use of good seed of recommended crop varieties is an important part of good farming—and adds little to cost—other recommended crop and soil management practices should be followed, too. A combination of good practices always works better than any one alone.



Corn

A large number of corn hybrids are available from seed companies and farmer-seedsmen. We can't list hybrids from all of the commercial companies here. Consult the 1957 Iowa Corn Yield Test bulletin for specific data on all hybrids entered in the 1957 Iowa Corn Yield Test. This bulletin will be available about mid-February. Farmer experiences and results from trials have shown that most hybrids sold under private pedigrees are well adapted and give excellent performance in Iowa. Sales representatives can give you information on their new and improved hybrids.

The hybrids listed below are those developed in the cooperative corn improvement program conducted by the Iowa Agricultural

I. J. JOHNSON is professor in charge of farm crops, Department of Agronomy. W. H. BRAGONIER is professor and head, Department of Botany and Plant Pathology.

The recommendations made in this article have been jointly prepared by the project leaders in agronomy (farm crops) and in botany and plant pathology. These recommendations have been reviewed by members of the Iowa Seed Council, including representatives from the Iowa Seed Dealers Association, the Iowa Crop Improvement Association and the Iowa Department of Agriculture.

and Home Economics Experiment Station and the USDA. They have met the certification standards of the Iowa Crop Improvement Association, and seed was produced in 1957.

Hybrids listed in the five general areas of the state are "full-season" in adaptation. Earlier hybrids should be used for late planting or for assurance of dry corn for earlier harvest to meet feeding needs. Occasionally the hybrids listed may be successfully grown farther north than the areas recommended, but the chances of frost damage become greater.

Dent Corn

Hybrids for northern Iowa:
Iowa hybrids 4417, 4483, 4558 and 4630.

Hybrids for north-central Iowa:
Iowa hybrids 4297, 4298, 4316, 4376, 4397, 4470, 4570, 4575 and 4600.

Hybrids for central Iowa:
Iowa hybrids 4249, 4298, 4376 and 4570.

Hybrids for south-central Iowa:
Iowa hybrids 4439, 4622 and Ohio C-92.

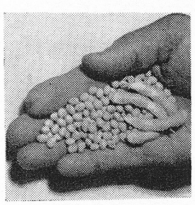
Hybrids for southern Iowa:
Iowa hybrids 4517, 4565; AES 801; Ohio C-92; U.S. 13.

Popcorn

Hybrids for northern and north-central Iowa:
Iopop 5, Iopop 7.

Hybrids for north-central to southern Iowa:
Iopop 6, Iopop 8, P202 and P213.

Hybrids for central to southern Iowa:
P31, P32 and P303.



Soybeans

It's important to choose a variety that uses the full growing season but reaches maturity before a killing frost. The varieties listed below do this when planted at the normal dates in the areas indicated.

Soybeans are often used to replace crops lost through flooding, hail or other reasons. If this need arises, early maturing varieties for your area may be planted at later than normal dates and still produce a fair crop. Write to the Agronomy Department at Iowa State College for special recommendations.

Northern Iowa:

Chippewa—A high-yielding variety about 1 week earlier in maturity than Blackhawk but compares favorably with it in all other characteristics. Chippewa is expected to replace other varieties of similar maturity.

Blackhawk—Early, medium-tall, lodging resistant and high in oil and yield.

Hawkeye—For western and southernmost counties of northern Iowa. High yield, tall and lodging resistant.

North-central Iowa:

Hawkeye—Most widely grown variety in the northern half of the state.

South-central Iowa:

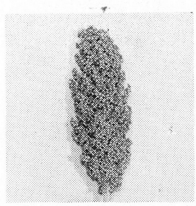
Adams—Popular variety with high yield, tall; more lodging resistant and a few days earlier than Lincoln.

Lincoln—High yield, tall; may lodge somewhat when growth is heavy.

Southern Iowa:

Adams and *Lincoln.*

Clark—A high-yielding variety. About 1 week later than Lincoln and 3 to 4 bushels higher in yield; stands well.



Grain Sorghums

There has been a considerable increase in acreage of sorghums for grain in Iowa during the past year. Sorghum grain is similar to shelled corn in feeding value. Grain sorghum yields are relatively better than corn under drouth and high-temperature conditions, but may be lower than corn when rainfall is adequate. Generally, grain sorghums appear to be best adapted to the western and southern counties.

Tests have been made at several locations in Iowa to compare dwarf sorghum hybrids developed at experiment stations and by seed companies with the older varieties. Data from these tests are available from your county extension director and from the College. Sorghum hybrids vary widely in maturity, yield, height and lodging. Adequate seed supplies are now available from farmer-seedsmen and from local seed dealers. Station hybrids that were eligible for seed certification in 1957 and standard varieties are listed below according to their maturity.

Early Maturing:

RS 501—A high-yielding but tall hybrid somewhat susceptible to lodging. Best adapted to northern Iowa for early planting (late May to early June) and for late planting (last half of June) in south-central Iowa.

Norghum and Reliance—Satisfactory in yield for early planting in northern and late planting in south-central Iowa.

Midseason Maturing:

RS 590—A high-yielding hybrid, satisfactory in height and stands fairly well. Best adapted for early planting in north-central and central Iowa and for late planting in southern Iowa.

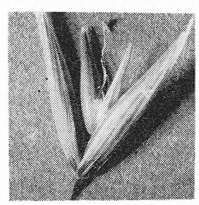
Martin, Midland and *Redbine 60*—Medium in grain yield and quality. Red seeded and similar in height and maturity.

Medium Late to Late Maturing:

RS 610 and *TX 620*—High-yielding hybrids satisfactory in height. RS 610 is more susceptible to lodging than TX 620. Best adapted for early planting in south-central and southern Iowa.

RS 650—A high-yielding hybrid. Later in maturity than RS 610 and best adapted for early planting in southern Iowa.

Redbine 66 and *Combine Kaffir 60*—Medium yield and satisfactory in height. Combine Kaffir 60 is white seeded, may be affected in grain quality by adverse fall weather conditions and is more susceptible to lodging than Redbine 66.



Small Grains

Oat Varieties

The 1957 growing season was favorable for oat production in

Iowa. State average yields of 43 bushels per acre were 15 percent above the 10-year period. Oats headed later than normal but cool weather resulted in plump grain, especially for the crown rust resistant varieties. In central Iowa there was considerable blasting of kernels. This condition may have been caused by extremely cold weather during mid-May at a critical stage in early head development. Stem rust was almost absent in 1957, but crown rust caused considerable damage to yield and test weight and caused lodging of susceptible varieties of midseason or late maturity.

None of the available varieties is entirely satisfactory in all respects—including resistance to all diseases. A common practice on farms with a large oat acreage is to plant two or three varieties. This spreads the date of harvest and reduces the risk of loss from any one disease.

The following oat varieties were eligible for seed certification in 1957. They are listed in alphabetical order in each maturity group.

Early Maturing:

Bonham—A pink, plump-kerneled variety; has the highest yield of the three early varieties in Iowa trials. Susceptible to race 7 of stem rust and to crown rust; but resistant to race 8 of stem rust.

Cherokee—Very similar to Bonham in disease resistance and plant characteristics.

Nemaha—Similar to Cherokee and Bonham in plant characteristics and disease resistance.

Midseason Maturing:

Burnett—Produced the highest yield of the midseason varieties. Plump white grain of high test weight. Medium in straw strength. Resistant to all races of stem rust except 7A and moderately resistant to crown rust. Susceptible to a nonparasitic leaf spot, cause unknown and damage apparently slight. Some certified seed available for 1958.

Clarion—A variety which produces strong straw and high test weight grain. Has yielded relatively higher in southern than in northern Iowa. Resistant to race 7 of stem rust but susceptible to race 8 of stem rust and to prevalent races of crown rust.

Clintland—Essentially Clinton with added resistance to race 202 of crown rust. It is susceptible to race 7 but resistant to race 8 of stem rust. Clintland has yellow, medium-sized kernels and stiff straw.

Newton—Plump grain of good test weight. Short, stiff straw. A good yielder except in northwest Iowa. Susceptible to race 8 of stem rust and moderately susceptible to crown rust.

Late Maturing:

Sauk—A medium stiff-strawed, high-yielding variety. Test weight varies from medium to light. Resistant to race 7 of stem rust, moderately resistant to crown rust but susceptible to race 8 of stem rust.

Barley Varieties

Most barley produced in Iowa is used as feed for livestock. Some varieties may bring premium prices as malting barley if care is taken in production and harvesting. Two varieties are recommended for 1958.

Kindred (malting type)—Also called "L" barley; has plump white grain desired for malting; good yielding, six-rowed, rough-awned, medium-maturing, weak-strawed. Resistant to stem rust and moderately resistant to bacterial blight and the root rots; susceptible to leaf rust, mildew, smut, scab, stripe and some strains of spot blotch.

Plains (feed type)— Has large white grain, is high yielding, six-rowed, smooth-awned, early maturing, short, stiff-strawed. Resistant to stem rust and drouth; susceptible to loose smut, leaf rust, spot blotch, scab and bacterial blight.

Flax Varieties

Flax, like barley, is grown largely in the northwestern sections of the state. Flax is a good companion crop for forage seedings when weeds aren't a serious problem. Midseason-maturing varieties have given most consistent yields in Iowa.

Marine—Early maturing variety that has yielded fairly well. Resistant to wilt and rust; most tolerant to pasmo of commercial varieties.

Redwood—High-yielding variety of midseason maturity, resistant to all prevalent races of rust, moderately wilt resistant, susceptible to pasmo.

Wheat Varieties

Winter wheat generally outyields spring-sown varieties and has given the most consistent performance in southern and southwestern sections and along the Missouri River bottomlands.

Winter Wheat Varieties:

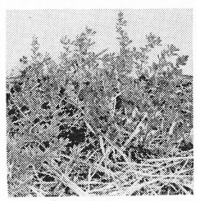
Comanche—Moderately high yielding, bearded, early maturing with short, medium-stiff straw. Somewhat lacking in winterhardiness and recommended only for southern Iowa. Resistant to stem rust (except race 15-B) but susceptible to leaf rust and loose smut.

Minter—High-yielding, bearded, midlate maturity, medium-tall, weak-strawed. Good winterhardiness, especially recommended for central and northern areas of the state.

Pawnee—Moderately high yielding, bearded, early maturing, stiff-strawed, short; somewhat lacking in winterhardiness; recommended primarily for southern areas of state.

Spring-Sown Varieties:

Henry, Lee, Rushmore and *Selkirk*—High yielding and stand well. Henry has been the top yielder but produces a poor-quality flour and is recommended only for feed. Lee has the best resistance to leaf rust. Rushmore, an early maturing, beardless variety, appears best suited for sowing in oat-wheat mixtures. Selkirk has moderate resistance to race 15-B of stem rust.



Forage Crops

New varieties are becoming more widely grown by Iowa farmers. Experimental trials have shown that these have considerable superiority over older varieties. Certified seed is recommended because it assures you of varietal purity.

Alfalfa Varieties

The newer varieties have proven their superiority in forage production, winterhardiness and wilt resistance and are rapidly replacing older varieties. Certified seed produced in any area from foundation stocks maintained in the area of adaptation is entirely satisfactory for Iowa farms.

Vernal—A new variety having a high level of wilt resistance and winterhardiness. Yield trials have shown Vernal to be outstanding in production of forage under both hay and pasture management. Recommended especially for long-term stands in all parts of Iowa.

Ranger—The most popular wilt-resistant, winterhardy variety. Has given outstanding performance in forage yields and persistence. Adapted to all areas in Iowa.

Buffalo—Resistant to bacterial wilt and outstanding in yield of forage in southern two-thirds of Iowa. Often outyields Ranger. Not recommended for northern Iowa.

Atlantic—A high-yielding, winterhardy variety developed in New Jersey. Does not have a high level of wilt resistance but in performance is superior to common alfalfa for 2-3 year stands.

Ladak, Cossack, Grimm and *Northern Common*—May be satisfactory, for short-term stands. However, certified seed supplies often are limited, and many lots (not certified) have not shown trueness to variety in field trials.

Red Clover Varieties

In recent years there has been a marked change toward less red clover and more acres planted to alfalfa for meadows. Red clover is still an important forage crop for short rotations, especially in eastern Iowa.

Common—Seed of known origin in Iowa, other midwest states and similar latitudes in Canada is adapted to Iowa conditions.

Kenland—Originated in Kentucky and resistant to southern anthracnose. Usually produces yields of forage as high as for any variety. Seed supply adequate.

Pennscott—Developed in Pennsylvania, this variety is highly productive and approximately equal to Kenland in Iowa.

Midland—A combination of well-adapted Corn Belt strains. Little seed available.

Dollard—A Canadian variety resistant to northern anthracnose. Best adapted to northern Iowa. Seed supply limited.

LaSalle—A Canadian variety similar in adaptation to Dollard.

Sweetclover Varieties

For many years sweetclover has been the leading crop for legume green manure in seedings with oats or other grains. Stands should be plowed down either in late fall or in the spring in time for corn planting. Watch for weevil damage; weevil-resistant varieties are not available.

Hubam—Annual white. Not as high in yields of nitrogen and organic matter as biennial types but may be plowed in the fall without danger of volunteer growth the following year.

Madrid—Biennial yellow. Produces excellent yields of nitrogen and organic matter in the first-year growth.

Ladino Clover

Ladino clover is a larger and much more productive variety than common white clover. Ladino is recommended in rotation pasture and in meadow mixtures except where moisture may be a limiting factor. It's also valuable for green manure when seeded with oats in mixtures with other legumes such as red clover, alfalfa and sweetclover. Seed costs are relatively lower than for other legumes because the seeds are very small. Adding ½ to 1 pound of seed in legume mixtures gives a good stand of Ladino.

Birdsfoot Trefoil

Birdsfoot trefoil is a deep-rooted, winterhardy perennial legume for use in permanent and long-rotation pastures. It's adapted to a wide range of soil conditions, but establishment often is slow. Birdsfoot trefoil grows well in mixtures with Kentucky bluegrass and orchardgrass.

Empire—Semi-prostrate growth habit; recommended for pasture use. Seed produced in Iowa or Minnesota from New York Empire is equal in performance to that produced in the eastern states.

European—Imported broadleaf, upright types, not as winterhardy as Empire and must be managed carefully to persist under grazing.

Cascade, Granger, Mansfield, Parker and *Viking*—Varieties of the upright type developed by selection from European. These varieties are superior to Empire in hay yields. Seed supplies are limited.

Lespedeza

Korean lespedeza is useful for improving pastures in southern Iowa—especially soils that are too steep to be plowed.

Iowa 6—An early, wilt-resistant selection that produces high yields of forage and seed. Stands are maintained by profuse self-reseeding year after year.

Bromegrass

Bromegrass is a widely adapted, hardy grass for good soils. It does best when grown with a legume, especially alfalfa. But stands depleted of legumes can be stepped up considerably in seed and forage production by applying nitrogen fertilizer (60 to 80 pounds of nitrogen per acre).

Recommended varieties—all similar in performance—are:

Fischer, Lincoln and *Achenbach*—Widely grown southern types; tall, leafy and good seed producers under proper management.

Southland—A new variety similar in performance to the southern types. Has good spring recovery.

Sudangrass

Because of its rapid, vigorous growth in hot, dry weather, sudangrass does well for summer pastures. It also has value as an emergency pasture or hay crop in adverse seasons.

Piper—Early, rapid in growth and recovery; disease resistant and high in yield; low in prussic acid content.

Greenleaf—A new variety from Kansas. Late, leafy and disease resistant with juicy stems and sweet forage. Satisfactory in yield.

Forage Sorghums

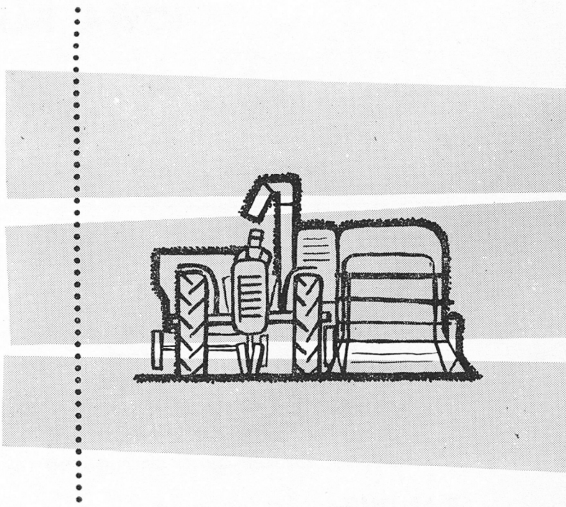
Several new forage sorghum hybrids will be available in 1958. Some of these are early as Axtell or Norkan, others are as late or later than Atlas. Forage sorghum hybrids may or may not be superior in forage yield, and some are susceptible to lodging. Data from experimental trials are limited, and care should be taken to choose a hybrid of suitable maturity. Combine-type grain sorghums can be used for forage but will yield only 50-70 percent as much as the forage types.

Among the varieties that have been tested, the following are recommended for use.

Norkan, Axtell, Rox Orange and *Waconia Orange*—Good yielding, palatable types for early planting (late May) in northern Iowa and late planting (late June) in central and southern Iowa.

Atlas—High-yielding, tall, lodging-resistant, late variety for early planting in central and southern Iowa.

Farm Custom Rates for 1958



Farm custom work—hiring, doing or exchanging services—offers several possibilities for cutting machinery costs in 1958. And the 1958 Iowa Farm Custom Rate Guide can help you figure your custom work costs.

by Ray E. Armstrong

CUSTOM WORK offers two distinct possibilities for cutting machinery costs in 1958. Whether you can or should take advantage of one or both depends to some extent on the size of your farm, the machinery you have and the time or labor you have available. One possibility is to perform custom work for others with some of your machinery. The other is to use the services of a neighbor offering to do custom operations.

Experiment Station studies have shown that some Iowa farms have more machine capacity than can be fully used on the farm where located. In this case, using some of this capacity in *doing* custom work for neighbors permits you to make fuller use of a machine and to earn a return on this use.

Other farms meanwhile lack one or more particular pieces of equipment to do a given job most efficiently, and the operator may not want to invest in a machine to do this particular job—especially if it cannot be used very much or also for other purposes. The opportunity here is that of *hiring* custom work to get the job done without a substantial machinery investment.

Some operators may find it advantageous to follow up both opportunities—hiring some types of custom work on his own farm and, at the same time, offering some custom services to his neighbors.

RAY E. ARMSTRONG is assistant professor of agricultural engineering and manager of the College Farm Services.

There are cost-saving possibilities on nearly every farm, though they may be quite different from farm to farm. While the purpose of this article is to deal with custom rates, we recommend that you look over and seek out other cost-saving prospects on your farm. Some things have to be balanced off against others, but you're generally ahead wherever you can do the same job that you've been doing at lesser cost.

Custom Work . . .

Supply and demand for custom services and machinery set the effective going rate—the combination of the number of operators willing to do custom work and the number of operators seeking custom services. The information in this article is intended only as a guide in determining the rates to charge or the rates you can expect to pay for custom services.

Certain types of equipment aren't used enough in some areas for a "going rate" to be set by supply and demand. And, often, a transaction is between parties not wishing to bargain for "all they can get." Or, an exchange of services between the parties may be involved. Individual local conditions must be considered in using and adjusting the rates given in the 1958 custom rate guide.

The Iowa State College Farm Services Department has the responsibility for a considerable amount of farming operations and services of field tillage and crop harvesting for other departments of the college. This provides the opportunity to study the costs of certain farm operations. It is from this experience and background, plus cooperation of people working in the field of farm management and costs supplied to us from colleges and universities in adjoining states, that we develop the suggested custom charges and rates. Most of the services performed by the Farm Services Department are, in fact, handled on a custom basis, with the costs charged back to the departments for which the work is done.

At the beginning of each year, we prepare an adjusted schedule of service rates. Each charge is determined by anticipating increases or decreases based on several years' records. *Labor* costs are carried as a separate item in our rates and, thus, are NOT included in the custom rate guide.

The guide rates are based on the approximate unit cost of work done under normal conditions and are generally applicable to most Iowa conditions. For highly favorable conditions—large fields, long rows, etc.—the rate should be less than suggested in the guide. For unfavorable conditions—small or irregular fields, poor soil conditions, etc.—the rates should be adjusted upward. Labor charges have been omitted because these vary with local conditions and among different parts of the state.

How To Use Guide . . .

Suggested charges and rates in the guide apply to normal working conditions. Remember that it is only a guide and that the actual "going rate" locally may be above or below that listed.

The cost of owning and operating farm power units and machinery may be divided into two separate cost items —cost of ownership and cost of operation. Both are taken into consideration in the rates suggested in the guide.

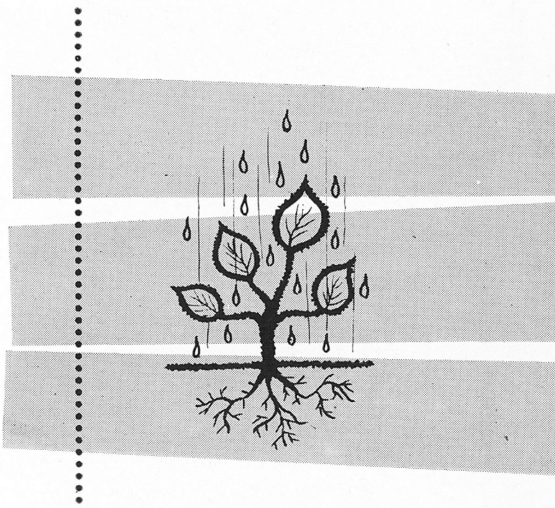
Cost of ownership represents a fixed cost, including costs of (1) depreciation, (2) interest and investment, (3) taxes and insurance and (4) housing.

Cost of operation or the actual out-of-pocket cost for operating a tractor or machine is a variable cost and is directly dependent on amount of use, including (1) fuel or power cost, (2) repair, (3) lubrication, etc.

IOWA FARM CUSTOM RATE GUIDE—1958

Farm operation	Suggested charge under normal conditions (labor NOT included)	
	Per hour	Per acre
TILLAGE:		
Plowing, 2-bottom	$2.50	$2.75
Plowing, 3-bottom	3.00	2.50
Disk harrow, 15-foot single	2.00	0.50
Disk harrow, 10-foot tandem	2.50	0.80
Disk harrow, 14-foot tandem	3.00	0.70
Spike-tooth harrow, 22-foot	1.80	0.25
Spring-tooth harrow, 17-foot	2.00	0.65
Packing, double-gang corrugated roller	2.00	0.65
PLANTING:		
Drill, small-grain, 11-foot	3.00	0.80
Drill, small-grain, 11-foot, with fertilizer attachment and grass seeder	4.25	1.10
Endgate seeder	1.25	0.30
Packer seeder	2.50	0.65
Plant corn, drill, 2-row	1.50	1.00
Plant corn, drill, 4-row	3.00	0.90
Plant corn, check, with fertilizer, 2-row	1.75	1.20
Plant corn, check, with fertilizer, 4-row	4.00	1.00
CULTIVATION:		
Rotary hoe or weeder, 2-row	1.80	0.50
Rotary hoe or weeder, 4-row	2.50	0.40
Cultivate, 2-row	1.75	0.85
Cultivate, 4-row	3.00	0.70
Cultivate and fertilize, 2-row	2.00	1.05
Cultivate and fertilize, 4-row	3.25	0.90
HARVESTING:		
Corn picking, 2-row	6.50	3.25
Combining, direct or pick-up	7.00	3.50
Corn combining	8.00	4.00
Windrowing	2.50	0.85
Forage harvesting, corn and sorghum	6.00	6.00
Forage harvesting, grass and legume	5.00	5.00
HAYING:		
Mowing or pasture clipping	2.25	0.75
Raking, side delivery	2.50	0.80
Baling, field pickup	0.11 per bale	.....
Field chopping	6.00	.....
FERTILIZING:		
Spread commercial fertilizer, broadcast	2.25	0.70
Tractor and manure loader	2.00	.....
SPRAYING:		
Sprayer, tractor with attached or trailer-type boom	1.30	.....
Sprayer, high-clearance, self-propelled	1.00	.....
MISCELLANEOUS:		
Mowing roadsides	2.50	.....
Cut cornstalks, 2-row, rotary-type	2.50	1.20
Bore post holes	2.00	.....
Saw wood, chain saw	2.50	.....
Tractor only, 2-plow	1.25	.....
Tractor only, 3-plow	1.50	.....
Tractor only, 4-plow	1.75	.....
Shell corn	$2\frac{1}{2}$c per bushel	.....
Dry shelled corn or small grain	1c per bushel per percent of moisture removed; 5c minimum charge per bushel	

Crop Prospects for 1958



Soil moisture conditions have returned to near normal in much of the state. Coupled with known probabilities for rainfall in a given year, it is possible to forecast general crop prospects for Iowa in 1958.

by R. H. Shaw and E. R. Duncan

WE OFTEN hear statements about "average" weather conditions for a certain month. But average temperature or rainfall tells us only a little about the weather. Ranges in rainfall or temperature and the chances of getting certain weather conditions tell us more. Day-by-day forecasts for long periods of time in advance can't be made accurately. But it is possible to predict the chances of getting a certain temperature or a given amount of rainfall, for example, within a particular period.

Here's what we mean: Last summer we said that the chance of a 32° temperature occurring in central Iowa by Oct. 5 was 50:50. This is a climatic probability statement based on past records. It simply says that, in half of the years, a temperature of 32° or lower will occur on or before Oct. 5 and that it will occur after Oct. 5 in the other half. Last fall the first 32° temperature came on Oct. 10. Unusual? No, from past records we'd expect it to occur on or after this date about 1 year in 4. So while it's not possible to make a forecast for a particular year, it is possible to predict the chances of a freeze on any given date.

The same is true for precipitation. We can't forecast the amount in a given period far in advance, but we can give you the chances of getting a certain amount. We know also that rainfall varies—both in amount and distribution. And we're learning more about the role of soil moisture reserves—moisture held and stored in the soil before and during the growing season—in producing crops, particularly corn.

"Moisture Reserve" . . .

Rainfall has varied considerably in the past few years. Parts of Iowa had severe rainfall deficiencies in 1953, and a research program to study the effects of subsoil moisture on crop yields was initiated early in 1954. Subsoil moisture samples to a depth of 5 feet were taken at selected locations in April, June, August and November in that year and each year since. This has provided information on the amount of water used in producing a corn crop. The table shows average yields for the 3 years, 1954-56, for different amounts of water use for the period, April 15 to Nov. 1.

Water use shown includes that actually used by growing plants, runoff from the soil surface, percolation through the soil and evaporation from the surface. There was a wide variation in yields at each of the water use levels at different locations because of differences in soil type, fertility, management, etc. But yields uniformly increased with water use.

Corn Yield and Water Use

Water use (inches)	Yield (bu./A.)
Less than 17½	30
17½ to 20	48
20 to 22½	64
22½ to 25	75
More than 25	88

Now, where does corn get this water? Average rainfall from April 15 to Nov. 1 varies in different parts of the state. Northwest Iowa *averages* slightly over 21 inches; central and southeast Iowa, almost 23 inches, according to Weather Bureau records for 1931-55. And these amounts appear sufficient to produce a pretty good corn crop, though not a bumper one.

But this is *average* rainfall. Half of the time actual rainfall will be less than this. And, even in years of favorable rainfall, poor distribution may mean that plants will suffer moisture shortages during some periods of the year. *Reserve soil moisture, however, can supply water for these periods. And, if the*

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moisture reserve is high, it will reduce the amount of summer rainfall needed by the crop.

Recent experience has shown that 50 percent or more of field capacity to a depth of 5 feet is about a minimum reserve in this regard. Each foot of a silt loam soil can hold about 2 inches of moisture available to plants; sandy soils hold much less.

In general, if a soil has less than a third of the moisture it can hold, the odds or chances for a corn crop are fair to poor. If it holds 3 to 6 inches, the outlook is much better; if over 6 inches, excellent.

In November 1955 at Ames, for example, the soil carried a reserve of less than 3 inches to a depth of 5 feet. April 15 to Oct. 31 rainfall was 16.6 inches, and the corn crop was a near failure. Chances for getting that little rainfall or less were about 1 in 9. In November, 1956 the soil moisture was only 2 inches. Rains from April to November 1957, however, amounted to 27 inches, with excellent distribution. But we can expect this amount of rainfall in only 1 out of 3 years. The yield was excellent and shows that it's possible to produce good yields with low subsoil moisture—if rainfall is above normal and well distributed.

But the thing to remember is that favorable soil moisture can provide nearly half of the moisture for a satisfactory crop. There must be some rain, and good distribution is very important.

Prospects for 1958 . . .

The map shows the available moisture in the soil at selected locations in different parts of the state for February 1954 and early November of 1954, 1955, 1956 and 1957 in that order. The *bottom* figure is that for November 1957.

Moisture supplies in western Iowa are the best since 1954 when the study was started. The two dry spots last fall were at Beaconsfield in south-central Iowa and at Kanawha in north-central Iowa. We believe, however, that the Kanawha location is drier than most of the surrounding area and that a moisture supply of closer to 5 inches would be more representative of that area. The eastern part of the state doesn't have as much soil moisture as it has had in some years but still has a good crop outlook.

Wherever subsoil moisture is 50 percent or more of field capacity (over about 5 inches), prospects for the 1958 corn crop are favorable. Where soil moisture is 25 to 30 percent of field capacity (2-5 inches), rainfall must be above normal in amount and favorable in distribution for high yields. And the probabilities are against this.

Other Meaning . . .

With a return to near-normal soil moisture conditions in most of the state, it becomes appropriate to again consider the proper maturity ratings of corn, grain sorghums and soybeans. Conditions last fall resulted in some soft corn and quite a lot of high-moisture corn and grain sorghum.

Assuming more normal moisture conditions, planting more of the acreages to adapted and early varieties will assure a better distribution of harvesting labor and will minimize losses from lodging and high-moisture grain.

Subsoil Moisture Conditions, 1954-57